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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte JEFFREY R. THOMAS, RANDALL G. BAXTER,
MARK A. ULRICH, and PAUL D. VERHAGEN

Appeal 2010-000528
Application 09/995,037
Technology Center 1700

Before PETER F. KRATZ, CATHERINE Q. TIMM, and
RAE LYNN P. GUEST, *Administrative Patent Judges*.

GUEST, *Administrative Patent Judge*.

DECISION ON APPEAL

I. STATEMENT OF CASE

Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision to reject claims 1-6, 8, 47, 51-55, 57-62, 64-87, and 91-94. We have jurisdiction under 35 U.S.C. § 6(b).

We AFFIRM-IN-PART.

Appellants' invention relates to a portable induction heating system that enable large amounts of current to flow through an induction heater and high temperatures to be achieved in a workpiece with sufficient cooling to avoid damaging the induction heating cable. Claims 1, 47, and 57 are illustrative:

1. A portable induction heating system, comprising in a portable unit:

a power source electrically coupleable to a fluid-cooled induction heating cable and operable to produce a varying magnetic field;

a programmable power source controller coupled to the power source for regulating the power conversion; and

a cooling unit fluidically coupleable to the fluid-cooled induction heating cable for providing a cooling fluid through the fluid-cooled induction heating cable and around a workpiece to cool the fluid-cooled induction heating cable, wherein the cooling unit is configured to cooperate with at least the fluid-cooled induction heating cable to provide a single continuous cooling path operable to dissipate heat from the fluid-cooled induction heating cable and from an electrical lead extending from the portable induction heating system to the fluid-cooled induction heating cable.

47. A portable heating system, comprising in a portable unit:

a power source operable to apply output power to an electrical pathway to inductively heat a workpiece, wherein the electrical pathway includes an induction heating cable adjacent the workpiece, a supply path from the portable heating system to the induction heating cable, and a return path from the induction heating cable to the portable heating system;

a power source controller operable to control the heating of a workpiece in response to programming instructions

provided by a user to produce a desired temperature profile in the workpiece;

a cart operable to transport the power source and power source controller to the workpiece;

a cooling unit operable to provide a flow of cooling fluid, the cooling unit being disposed on the cart; and

the induction heating cable, wherein the induction heating cable is a fluid-cooled induction heating cable that cooperates with the cooling unit to form at least a portion of a single cooling pathway that is configured to generally extend along the supply path and the return path of the electrical pathway to remove heat therefrom.

57. A portable induction heating system, comprising in a portable unit:

a power source electrically coupleable to a portable fluid-cooled induction heating cable and operable to provide output power to produce a varying magnetic field;

a programmable controller operable to control induction heating;

a cooling unit fluidically connected to the fluid-cooled induction heating cable to cool the fluid-cooled induction heating cable via a cooling fluid, wherein the cooling unit dissipates heat in the cooling fluid; and

a flow switch coupled to the programmable controller, wherein the flow switch is configured to detect the cooling fluid returning from the fluid-cooled induction heating cable and to effect discontinuation of the output power when the amount of the cooling fluid returning from the fluid-cooled induction heating cable is below a threshold amount.

The Examiner relies upon the following evidence:

<u>First Named Inventor</u>	<u>Document No.</u>	<u>Issue or Pub. Date</u>
Somes	US 2,359,058	Sep. 26, 1944
Henderson	US 3,403,240	Sep. 24, 1968
Antier	US 4,058,696	Nov. 15, 1977
Duncan	US 5,198,053	Mar. 30, 1993
Couffet	US 5,430,274	Jul. 4, 1995
Cydzik	US 5,874,713	Feb. 23, 1999
Thomas (Thomas '483)	US 6,727,483 B2	Apr. 27, 2004
Thomas (Thomas '439)	US 7,015,439 B1	Mar. 21, 2006

The Examiner maintains, and Appellants seek review of, the following rejections:

1. The rejection of claims 1-6, 8, 47, and 51-55 under the judicially created doctrine of obviousness type double patenting over claims 1-30 of Thomas '483;
2. The rejection of claims 57-62, 64-87, and 91-94 under the judicially created doctrine of obviousness type double patenting over claims 1-30 of Thomas '483 in view of Somes;
3. The rejection of claims 1-6, 8, 47, 51-55, 57-62, 64-87, and 91-94 under the judicially created doctrine of obviousness type double patenting over claims 1-28 of Thomas '439;
4. The rejection of claims 1-6, 8, 47, 51-55, 57-62, 64-87, and 91-94 under 35 U.S.C. § 103 as unpatentable over Henderson in view of Couffet, Antier, and Duncan;
5. The rejection of claims 57-62, 64-87, and 91-94 under 35 U.S.C. § 103 as unpatentable over Henderson in view of Couffet, Antier, Duncan, and Somes;

6. The rejection of claims 79-87 and 91-94 under 35 U.S.C. § 103 as unpatentable over Henderson in view of Couffet, Antier, Duncan, Somes, and Cydzik.

II. OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTIONS BASED ON THOMAS ‘483

The dispositive issue presented for both the first and second rejections is the same. More particularly, our decision focuses on the “controller” limitation common to each of the rejected claims.

A. DISPOSITIVE ISSUE ON APPEAL

A first issue on appeal arising from the contentions of Appellants and the Examiner is: does the evidence support Appellants’ view that the Examiner erred in concluding that a portable induction heating system having, among other things, a “controller” is not patentably distinct from the induction heating system claimed in Thomas ‘483? We answer this question in the affirmative.

B. DISCUSSION

Appellants contend that the Examiner has not established that certain recited elements, including the “controller” recited in each rejected claim, are rendered obvious by the claims of Thomas ‘483 (*see* Br. 9-14). We agree with Appellants.

The key question in any obviousness double patenting analysis is: “Does any claim in the application define merely an obvious variation of an invention claimed in the patent asserted as supporting double patenting?” *General Foods v. Studiengesellschaft Kohle mbH*, 972 F.2d 1272, 1278 (Fed. Cir. 1992). It is critical during the analysis that no part of the patent disclosure be used as “prior art” against the claims under review, only the

inventions defined by the claims are relevant. *In re Vogel*, 422 F.2d 438, 441 (CCPA 1970); *see also In re Sarett*, 327 F.2d 1005, 1013 (CCPA 1964) (“We are not here concerned with what one skilled in the art would be aware [of] from reading the claims but with what inventions the claims define.”).

We note that claims 1-30 of Thomas ‘483 are directed to an induction heating system comprising a power source, a fluid cooling unit, and a flexible fluid-cooled induction heating cable (*see* Thomas ‘483, claims 1-30). However, the Examiner has directed us to nothing in the patented claims directed to using a controller or automating the system claimed in Thomas ‘483.

We adopt the Appellants’ position that “[t]he Examiner appears to be applying the wrong legal standard, and has not addressed the deficiencies of the rejections previously pointed out in pages 8-16 of the Appeal Brief” (Reply Br. 3).

The Examiner repeatedly asserts “a power source and coupleable cooling unit of USP ‘483 are encompassed by [the instant claims]” (Ans. 8 and 11). The Examiner also includes copies of instant claims 1-3, 57, and 59 and patented claims 12 and 22 with certain claim limitations underlined (Ans. 9-12). Yet, the Examiner does not match the controller limitations recited in the instant claims to any element of the patented claims nor does the Examiner provide an explanation or rationale as to why an induction heating system having a controller would be not be patentably distinct from the invention claimed in Thomas ‘483. “[T]here must be some clear evidence to establish why the variation would have been obvious which can properly qualify as ‘prior art.’” *In re Kaplan*, 789 F.2d 1574, 1580 (Fed. Cir. 1986).

With respect to the second rejection, the Examiner does not rely on the teaching of *Somes* to meet the controller limitation of the claims, but rather to meet the “flow switch” limitation particular to claims 57-62, 64-87, and 91-94. Thus, the teachings of *Somes* do not remedy the deficiencies pointed out by Appellants.

Accordingly, we cannot sustain the obviousness-type double patenting rejections based on Thomas ‘483 or Thomas ‘483 in view of *Somes*.

III. OBVIOUSNESS-TYPE DOUBLE PATENTING REJECTION BASED ON THOMAS ‘439

With respect to the third ground of rejection, Appellants’ present arguments with respect to claims 1-6, 8, 47, and 51-55 as a group, for which we select claim 1 as a representative claim, and claims 57-62, 64-87, and 91-94 as a group, for which we select independent claim 57 as a representative claim (Br. 15).

A. DISPOSITIVE ISSUE ON APPEAL

A second issue on appeal arising from the contentions of Appellants and the Examiner is: does the evidence support Appellants’ view that the Examiner erred in determining that a portable induction heating system having, among other things, a “cooling unit” (as recited in independent claim 1) or a “flow switch” (as recited in independent claim 57) is not patentably distinct from the induction heating system claimed in Thomas ‘439? We answer this question in the affirmative.

B. DISCUSSION

Appellants contend that the Examiner has not established that certain recited elements, including the “cooling unit” and the “flow switch” recited

in the rejected claim, are rendered obvious (*see* Br. 15). We agree with Appellants.

We note that claims 1-28 of Thomas ‘439 are directed to an induction heating system comprising a power source, a temperature feedback device and a controller to control the power source based on the workpiece temperature (*see* Thomas ‘439, claims 1-28). The Examiner has directed us to nothing in the claims of Thomas ‘439 that directed to a cooling unit, a flow switch or using fluid as a cooling source.

The Examiner asserts “a power source and a programmable power source controller of USP ‘439 are encompassed by [the instant claims]” (Ans. 12). The Examiner also includes copies of instant claims 1, 47, and 51-54 and patented claims 1-8 with certain claim limitations underlined (Ans. 13-14). For the same reasons discussed above, we agree with Appellants that “[t]he Examiner appears to be applying the wrong legal standard, and has not addressed the deficiencies of the rejections previously pointed out in pages 8-16 of the Appeal Brief” (*see* Reply Br. 3).

Accordingly, we cannot sustain the obviousness-type double patenting rejections based on Thomas ‘439.

IV. OBVIOUSNESS REJECTIONS BASED ON HENDERSON IN VIEW OF COUFFET, ANTIER, AND DUNCAN

With respect to the fourth ground of rejection, Appellants present arguments with respect to claims 1-6, 8, 47, and 51-55 as a group (Br. 17-20). However, we find the scope of claims 1 and 47 sufficiently different to require us to separately address claims 1-6 and 8 as a group, with claim 1 as a representative claim and claims 47 and 51-55 as a group with claim 47 as a representative claim. Appellants then present arguments with respect to

claims 57-62, 64-87, and 91-94 as a group (Br. 20-21), for which we select independent claim 57 as a representative claim.

Claim 1

A. ISSUE ON APPEAL

A third issue on appeal arising from the contentions of Appellants and the Examiner is: does the evidence support the Appellants' view that the Examiner erred in concluding that an induction heating system with a cooling unit coupleable to a fluid-cooled induction heating cable and configured to cooperate with at least the fluid-cooled induction heating cable to provide a single continuous cooling path operable to dissipate heat from the fluid-cooled induction heating cable and from an electrical lead, as recited in claim 1, would have been obvious to one of ordinary skill in the art from the teachings of Henderson? We answer this question in the negative.

B. DISCUSSION

For the purposes of this rejection, we adopt the Examiner's findings in the Answer as our own and add any additional findings of fact appearing below for emphasis.

It is undisputed that Henderson teaches a first cooling path for the electrical leads and a second cooling path for the induction heating cable. Appellants contend that Henderson fails to render obvious a cooling unit that cooperates with a heat induction cable to form a "single continuous cooling path operable to dissipate heat from the fluid-cooled induction heating cable and from an electrical lead," as recited in claim 1 (Br. 17-20). We disagree with Appellants that claim 1 positively requires the presence of an induction heating cable meeting the recited claim limitation.

During examination, “claims . . . are to be given their broadest reasonable interpretation consistent with the specification, and . . . claim language should be read in light of the specification as it would be interpreted by one of ordinary skill in the art.” *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (*quoting In re Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990)).

Choosing to define an element functionally, i.e., by what it does, rather than what it is, carries with it a risk: Where there is reason to conclude that the structure of the prior art is inherently capable of performing the claimed function, the burden shifts to the applicant to show that the claimed function patentably distinguishes the claimed structure from the prior art structure. *See In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997); *In re Ludtke*, 441 F.2d 660, 664 (CCPA 1971); *In re Hallman*, 655 F.2d 212, 215 (CCPA 1981).

Claim 1 only structurally recites a power source, a programmable power source controller, and a cooling unit. Appellants have claimed the cooling unit functionally. Thus, the recited cooling unit need only be capable of being coupled to a fluid-cooled induction heating cable and need only be configured so as to be capable of cooperating with at least the fluid-cooled induction heating cable to form a single cooling path (*see* claim 1). We cannot agree with Appellants that the structure of the electrical leads or the structure of the fluid-cooled induction heating cable must be present to meet the structural requirements of claim 1.

Appellants do not dispute that Henderson teaches a cooling unit coupled to an induction heating element 22, which is fluid-cooled via inlet

conduits 14, 84, and 75 and outlet conduits 77, 84, and 12. Appellants' Specification provides no particular structure for the cooling unit.

As such, we determine it is reasonable for the Examiner to conclude that the cooling unit taught by Henderson has a structure which is *capable* of being connected to an induction heating cable to form a single cooling path. Appellants point to nothing in the structure of *the cooling unit* of Henderson that is different from the structure of the cooling unit claimed that would inhibit the capability of Henderson's cooling unit to be connected as claimed.

Appellants' arguments do not reach the Examiner's application of the teachings of Couffet, Antier, and Duncan.

Accordingly, we sustain the Examiner's rejection of claims 1-6 and 8 as obvious over the teachings of Henderson in view of Couffet, Antier, and Duncan.

Claim 47

A. ISSUE ON APPEAL

A fourth issue on appeal arising from the contentions of Appellants and the Examiner is: does the evidence support the Appellants' view that the Examiner erred in concluding that an induction heating system with a fluid-cooled induction heating cable that cooperates with a cooling unit to form at least a portion of a single cooling pathway that is configured to generally extend along a supply path and a return path of an electrical pathway, as recited in claim 47, would have been obvious to one of ordinary skill in the art based on the teachings of Henderson? We answer this question in the affirmative.

B. DISCUSSION

Appellants contend that Henderson, which teaches a first cooling path for the electrical leads and a second cooling path for the induction heating cable, fails to render obvious “at least a portion of a single cooling pathway” formed by the fluid-cooled induction heating cable as claimed (Br. 17-20). We agree with the Appellants that “the Examiner has not indicated where he believes the Henderson et al. reference makes such a disclosure” (Br. 20).

Specifically, the Examiner references Figure 4 elements as reading on “circulate cooling fluid” as apparently justifying a broad interpretation of the term “single cooling pathway” (Ans. 15). However, we are unable to understand how the Examiner has applied the prior art in light of this interpretation. The Examiner then identifies “water conduits 12 and 14 and water-cooled electrical conduits 16 and 18” (Ans. 15). In light of Appellants’ arguments, it is unclear how the Examiner finds that the claims read on both water conduits 12 and 14 and electrical conduits 16 and 18. The Examiner then recites a portion of Henderson discussing tubular elements 78, 82, and 80 as an “inter-connection” (Ans. 16). It is apparent from the teachings of Henderson that tubular elements 78, 82, and 80 are water conduits that interconnect water cooled electrical conduits 16 and 18 (Henderson, col. 3, ll. 5-25; Figure 5). The Examiner has not articulated his rejection such that he has matched the claim language to the teachings in the reference sufficient to establish a *prima facie* case of obviousness.

In the process of reversing the Examiner’s rejections, it is appropriate to interpret the recitations of claim 47. *In re Wilder*, 429 F.2d 447, 450 (CCPA 1970) (“[T]he first inquiry must be into exactly what the claims define.”). In doing so, we note that, unlike claim 1 discussed above, claim

47 positively recites a fluid-cooled induction heating cable forming “at least a portion of a single cooling pathway” that “generally extends” along a supply and return electrical pathway (*see* claim 47). A broadest reasonable interpretation of claim 47 would not require fluid-cooling along the entire electrical pathway. As such, it would appear that conduits 14 and 12 and their fluid connection to heating element 22 would read on the claimed single cooling pathway recited in claim 47. However, we are constrained to reverse the Examiner’s rejection by the Examiner’s failure to clearly articulate his rejection and the apparent reliance on conduits 16 and 18 as meeting the claimed limitations.

The water flowing through conduits 16 and 18 does not cool the induction heating coil (Henderson, col. 3, ll. 26-61). Thus, to the extent that the Examiner contends that conduits 16 and 18 constitute the fluid cooled induction heating cable recited in claim 47, we cannot agree with the Examiner.

Accordingly, we reverse the Examiner’s rejection of claim 47 as obvious over the teachings of Henderson in view of Couffet, Antier, and Duncan. Since the Examiner has applied the teachings of Henderson in the same manner for dependent claims 51-55, we are similarly constrained to reverse the rejection of these claims as obvious over Henderson in view of Couffet, Antier, and Duncan.

Claim 57

A. ISSUE ON APPEAL

A fifth issue on appeal arising from the contentions of Appellants and the Examiner is: does the evidence support Appellants’ view that the Examiner erred in concluding that an induction heating system having a flow

switch as recited in claim 57 would have been obvious to one of ordinary skill in the art having the teachings of Henderson? We answer this question in the affirmative.

B. DISCUSSION

The Examiner contends that Henderson teaches that, via solenoid 122, valve 120 turns off power to heating element 22 if no (low) coolant is circulating and turns on power to heating element 22 if detectable coolant is circulating (Ans. 17) (citing Henderson, col. 3, ll. 65-71).

Appellants contend that the Examiner has mischaracterized the teachings of Henderson and that, in fact, the opposite is true, i.e., that coolant flow through valve 120 is turned on and off based on whether power is being provided to the heating element 120 (Reply Br. 5).

We agree with the Appellants that the Examiner has improperly characterized the solenoid 122 and valve 120 taught by Henderson.

The Examiner has directed us to nowhere in the teachings of Henderson to show that solenoid 122 and/or valve 120 is configured to detect a coolant fluid, as recited in claim 57. Henderson states that “[t]he solenoid 122 . . . is connected to the power supply . . . to actuate the valve 120 through solenoid 122 to open position and supply cooling water to the induction heating element 22 only when power is being delivered to the heating element” (Henderson, col. 3, ll. 65-71). Thus, the solenoid 122/valve 120 feature of Henderson is not “configured to detect a cooling fluid,” but is merely opened and closed upon power being delivered to the heating element.

Accordingly, we cannot sustain the Examiner’s fourth rejection of claim 57 based on the teachings of Henderson. Since the Examiner has

applied the teachings of Henderson in the same manner to reach the “flow switch” limitation of each of independent claims 57, 68, 79, and 87 and the claims that depend therefrom, we cannot sustain the Examiner’s rejection of any of claims 57-62, 64-87, and 91-94 as obvious over Henderson in view of Couffet, Antier, and Duncan.

V. OBVIOUSNESS REJECTIONS BASED ON HENDERSON IN VIEW OF COUFFET, ANTIER, DUNCAN, AND SOMES

With respect to the fifth rejection, Appellants focus their arguments on the presence of a flow switch “configured to detect the cooling fluid returning from the fluid-cooled induction heating cable” that causes the output power to discontinue “when the amount of the cooling fluid returning from the fluid-cooled induction heating cable is below a threshold amount” that is common to independent claims 57, 68, 79 and 87, which we address with respect to the flow switch limitation of claim 57.

Appellants do not advance any additional arguments for the sixth rejection in addition to those addressed for the fifth rejection. Thus, the issues presented for both the fifth and sixth rejections are the same.

A. ISSUE ON APPEAL

With respect to the fifth and sixth rejections, a sixth issue on appeal arising from the contentions of Appellants and the Examiner is: does the evidence support Appellants’ view that the Examiner erred in concluding that an induction heating system having a flow switch as recited in claim 57 would have been obvious to one of ordinary skill in the art having the teachings of Henderson in view of Somes? We answer this question in the negative.

B. DISCUSSION

Appellants contend that “flow sensing device 17 [of *Somes*] operates in a manner diametrically opposed to, and cannot be logically equated with, the flow switch recited in the instant claims” (Br. 25). The Examiner does not dispute Appellants’ characterization of the teachings of *Somes* that flow sensing device 17 discontinues power output when the amount of coolant returning from the inducing head 10 is above a certain level, rather than below a threshold amount as recited in claim 57 (*see* Br. 24-25 and Ans. 7 and 17-18).

However, the Examiner notes that Appellants’ Specification does not disclose or define any particular structure for a flow switch that would necessarily cause it to perform the function of discontinuing power only when a low amount of coolant is detected (Ans. 16).

Appellants have defined the flow switch functionally, i.e., by what it does, rather than what it is. It is undisputed that the flow sensing device 17 of *Somes* is configured to be capable of detecting coolant returning from a heat induction head 10 and of sending a signal to a power source to control the output power based upon the particular detection of fluid. Thus, it is not clear that the structure of the flow switch claimed and the flow sensing device 17 of *Somes* is any different. To the contrary, it is reasonable for the Examiner to conclude that the same flow sensing device 17 would be inherently capable of sending a similar signal upon detection of low fluid as opposed to the detection of greater amounts of fluid. Thus, the burden is properly shifted to Appellants to show a structural distinction between the flow switch claimed and the flow sensing device 17 taught by *Somes*. *See In re Schreiber*, 128 F.3d 1473, 1478 (Fed. Cir. 1997); *In re Ludtke*, 441

F.2d 660, 664 (CCPA 1971); *In re Hallman*, 655 F.2d 212, 215 (CCPA 1981).

Accordingly, we sustain the Examiner's fifth rejection of claim 57 based on the teachings of *Somes*. Since the Examiner has applied the teachings of *Somes* in the same manner to reach the "flow switch" limitation of each of independent claims 57, 68, 79, and 87 and the claims that depend therefrom, we sustain the Examiner's rejection of claims 57-62, 64-87, and 91-94 as obvious over *Henderson* in view of *Couffet*, *Antier*, *Duncan*, and *Somes*.

With respect to the sixth rejection, Appellants' arguments do not reach the Examiner's additional application of the teachings of *Cydzik*. Thus, we sustain the Examiner's rejection of claims 79-87, and 91-94 as obvious over *Henderson* in view of *Couffet*, *Antier*, *Duncan*, *Somes*, and *Cydzik* for the same reasons discussed above.

VI. CONCLUSION

On the record before us and for the reasons discussed above, we sustain the Examiner's rejections of (a) claims 1-6 and 8 under 35 U.S.C. § 103 as unpatentable over *Henderson* in view of *Couffet*, *Antier*, and *Duncan*; (b) claims 57-62, 64-87, and 91-94 under 35 U.S.C. § 103 as unpatentable over *Henderson* in view of *Couffet*, *Antier*, *Duncan*, and *Somes*; and (c) claims 79-87 and 91-94 under 35 U.S.C. § 103 as unpatentable over *Henderson* in view of *Couffet*, *Antier*, *Duncan*, and *Cydzik*.

However, we cannot sustain (a) the obviousness-type double patenting rejections maintained by the Examiner or (b) the rejection of claims 47, 51-55, 57-62, 64-87, and 91-94 under 35 U.S.C. § 103 as unpatentable over *Henderson* in view of *Couffet*, *Antier*, and *Duncan*.

VII. DECISION

We affirm-in-part the Examiner's decision.

VIII. TIME PERIOD FOR RESPONSE

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

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